

# Proximity and territory versus space in regional science

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**Abstract.** Empirical evidence tends to show that regional development occurs only in certain places. Therefore, one can ask the central question of the role of physical proximity in economic development processes. Economists try to answer this question through the concept of externalities, but this does not explain why certain externalities are linked with physical proximity. In this paper the author tries first to show why mainstream economists are not able to catch the problem of proximity and territory in their model. It is argued that they make a systematic confusion between physical space and abstract mathematical spaces. In the second part of the paper a tentative definition of a territory is given and a first mathematical formulation of this concept is proposed. Starting from this definition, the author shows in the third part of this paper how a consideration of territory and proximity should change our understanding of economic development processes in general.

## 1 Introduction

In this paper I aim to clarify the role of proximity and distance in economic development processes. Today this issue is the subject of numerous debates for both the English-speaking and French-speaking regional scientists (*Revue d'Économie Régionale et Urbaine*, 1993). The reason for this is the attention that has been paid in the past twenty years to endogenous development processes (Courlet and Pecqueur, 1992; Pecqueur, 1987; Weaver, 1983), to industrial districts (Beccatini, 1990; Brusco, 1982; Garofoli, 1992), and to technopoles and innovative milieux (Maillat et al, 1993b). These works are based on a specific conception of space which is at odds with that of conventional approaches.

Conventional approaches hold that economic geography and the arrangement of actors and activities in space are but the projection at a functional level of a system which initially does not incorporate space, for example, when one posits the existence of markets that are not localized a priori and whose structure is not influenced by factors such as distance, proximity, representations of space, the existence of urban areas, or topography. Among these conventional approaches are the neoclassical approaches, including industrial economics, the economics of financial markets, the study of the influence of external factors, etc. For this paradigm, we shall see that there is a confusion between concrete space and abstract space (a vector space) through which thinking represents reality, because in this approach there is an assimilation between concrete space and a two-dimensional vector space, which I shall call the paradigm of  $\mathbb{R}^2$ .

Furthermore there are those—including myself—who take as their starting point concrete spaces—a region, towns, a 'territory'—and situated actors, who develop a school of thought in which real, physical, embodied space is a point of departure outside of which nothing exists. One then finds only markets whose functioning does not correspond to predefined, standard models, as if the functioning of the economy were composed only of specific cases. One thus has the paradigm of territorial space, based mainly on an opposition between proximity and distance.

Proximity can be defined as the *physical proximity of various actors and elements in a region, combined with multiple interdependences between these elements*. As for distance, it forms a duality with proximity: proximity links, distance separates. Distance is therefore not understood here simply as a transport cost but as a lack of a direct relationship in the spatial structure.

In this paper I review a series of criticisms which the proponents of each paradigm regularly level at one another. I will show that a number of misunderstandings lie not in the ‘greater scientific character’ of one or other school but in a misunderstanding about the concept of space. This misunderstanding is, of course, not innocent, as it results from the difference between the approaches, that is, from the difference in the researchers’ intentions. Now these intentions are not neutral and the researcher, whether or not he or she is aware of it, makes an initial choice that has major implications regarding the usefulness of the work to society and economists as a profession. This excursus is necessary in order to answer the question that is being asked more and more insistently today: what is the role of proximity in economic development?

In section 2 I examine the paradigm of  $\mathbb{R}^2$  space and show that the great majority of current economic approaches—including particularly those that claim to treat space in the same way as Krugman (1991a; 1991b)—wrongly assimilate real space and the spaces produced by thinking in vector spaces. In section 3 I describe the paradigm of territorial space and show that in this approach territory constitutes a *backcloth* of interrelations which one must take into account if one wishes to understand a concrete, that is a well-defined, economic situation. In section 4 I show how proximity and rationality are linked and suggest some links between proximity, distance, and economic development. In section 5, the conclusion, I develop the problem of researchers’ intentions and show that only the paradigm of territorial space allows development policies to be made which escape the hegemony of centres.

## **2 The paradigm of $\mathbb{R}^2$ space**

In section 2.1 I highlight the way in which our minds work to understand reality: they construct and use abstract ‘spaces’. In section 2.2 I will examine the way in which conventional economists treat space. We will then see that the projection onto a plane of vector coordinates such as transport costs, transaction costs, or some external factor of urban areas can by no means be claimed to explain a concrete space.

### **2.1 Space as an instrument of thinking and the surveyor’s objective space**

Space is the very instrument of thought. The special nature of space is the cause of economists’ difficulty and inability satisfactorily to take into account concrete space.

This is where the problem really lies: there is too often a confusion between real physical space and the space of the *metaphors* by which our thinking *represents* reality. Thus the governmental sphere is not round, and whenever one speaks of hierarchy one thinks of ‘top’ and ‘bottom’. In addition, there is a disturbing parallel between the way in which we apprehend a system of whatever nature and its geometric representation, made up of factors and relations, and perhaps graphs, vectors, and matrices. One need only think, for example, of Keynes’s economic circuit or the representation of a production system. Our mind conceives of reality in the form of abstract spaces. The graphs and diagrams that illustrate books in economics and human science testify to this. The arrangement of abstract categories and the way they are linked by our minds are in the end very similar to geometric representation of real space. There is a great similarity between a geographical map showing the arrangement of features in a concrete space and a diagram explaining

the abstract functioning of a production system; this is because of the way in which we conceive of reality. Thus by examining the diagram of a production system, two companies maintaining purchase–sale relations may be described as ‘close’ without there being any physical proximity.

As a result of this there are two kinds of space which must be clearly separated as a first step. First, there is a space that is merely the product of our thoughts, which is located only in our internal and subjective world. Second, there is an objective, metric space. It is the old debate between subjectivity and objectivity that is returning to centre stage in the discussion of space in economics. Is space preexistent, given, or objective? Or, on the contrary, is it a pure product of our subjective perception? Or should we transcend this dilemma? It is this last theory which I shall seek to defend through the paradigm of territorial space.

## 2.2 Newton and the economist

In the course of the history of science, it was only very gradually that physical space came to be represented by vector coordinates written in  $\mathbb{R}^2$  and projected onto a two-dimensional Euclidian plane. Previously, geometry had maintained a clear-cut separation between real space on the one hand and the representation thereof on the other (Atkin, 1974).

The Newtonian basis of physics was at the outset situated in a space that was regarded as objective, existing independently of us and generally having three dimensions. The mechanistic paradigm, which still characterizes most of the output in economics today, is based on this conception of space. Let us take a closer look at the impacts of this point of departure on spatial theories and practices.

In a mechanical system the universe is a set of points whose position is rigorously determined at every moment in relation to the previous moment and is theoretically calculable for any moment. The affirmation of the mechanism is thus that of mathematical solidarity among all the points of the universe and among all the moments in time of the universe, the reason for the mechanism being the unity of a principle in which everything that is juxtaposed in space and successive in time is contracting (Bergson, 1989, pages 347–348). Now such a system can easily be understood and conceived of without any medium other than our thought. This space can quite easily reflect no concrete space but only relations traced by our intelligence. This is how economists were to invent general equilibrium, a pure ‘vision of the mind’ (in the literal sense). Hence any economic relationship, any economic model, can be described and conceived of by and in a totally abstract space. In mathematical terms use will be made of vector spaces associated with  $\mathbb{R}$ , real numbers having as many ‘dimensions’ as there are variables. *This presupposes that the whole economic system described is situated at a single point in concrete space, because the implicit hypothesis is that there is no variation, neither in the variables nor in the relations, because of the extension of the system in a concrete space.* By construction, it is thus no longer possible to take account of the variation in price of a plot of land that may be caused by a change in position of a few hundred metres!

The question that then arises for the economist is: how can a model that extends over only one point be ‘spatialized’? Two considerations can be expressed at this point. First, when one constructs a model which, at a first stage, disposes of concrete space, the possibility of reintroducing the structuring effect of space in the economic relations traced by the model is irremediably lost. This point will be elaborated on in section 3, in which I show the nature of the interdependences (or, on the contrary, the independences) which concrete space *imposes* as a back-cloth on economic relations. The second consideration is that, when a model

(whether mathematical or not) which is said to be multidimensional in that it includes numerous variables is constructed, it leads to a *confusion* between dimensions, between vector or functional ‘spaces’ and concrete space, rather than to a *linkage* of these two types of space, the natures of which are radically different. This is where the error can occur. When such tools are employed, it is no longer possible to utilize as a representation of space a vector space associated with  $\mathbb{R}^2$ , as one would then be using a single language to describe a set of economic relations *and* a concrete space. Now that is where the problem lies: over the years economists have completely assimilated concrete space and its abstract representation. It is this inability to conceive of space other than as points on a Euclidian plane which originally gave rise to the exclusion of space from most contemporary economic approaches.

Let me state from the outset that this confusion between space as an instrument of thinking and real space is not strictly a result of the use of mathematical tools. For example, in his work entitled—symptomatically—*L’Économie Multidimensionnelle*, Bartoli (1991) demonstrates, without mobilizing any mathematical instrument, just how important it is to take account of multiple ‘dimensions’ of the real world ... and yet does not mention space once.

This is the most devastating type of confusion there can be for economists concerned with the development of real regions: the confusion between, on the one hand, a ‘mental’ space, a system that develops and functions according to the laws of our thinking and, on the other, a ‘real’ space, the subject of socioeconomic research. This confusion gives rise to a failure on the part of the overwhelming majority of economists to understand the ‘geographical’, ‘territorial’, and ‘regional’ approaches: they confuse conceived real space and any other relation constructed by thought in  $\mathbb{R}^n$ . Real space is consequently reduced to an incompatible gateway that introduces a tension and an intolerable superimposition between two types of space, the natures of which are fundamentally different and may not be reduced to one another. Therefore a choice has to be made and this choice, made by the researcher, is not an innocent one. Either researchers start with real space, investigating the way in which real space is perceived, represented, experienced, and transformed by the actors and the economic system; or they posit the preeminence of thought, and all existence, all economic phenomena, are reduced to a mental relationship uprooted from any concrete space. In the second case, concrete space is emptied and deprived of meaning and stripped of epistemological and methodological status.

### 2.2.1 *Examples of the inability of conventional economics to take space into consideration*

In order to illustrate this inability of economics in general and of mechanistically inspired economics in particular to ‘conceive of’ real space, it suffices to see how authors such as Christaller (1966) or more recently Krugman (1991a; 1991b) introduce a ‘spatial dimension’ into their thinking. Real space is not treated as such, but is always reintroduced into the model in the indirect form of transport costs, these being axiomatically a function of a physical ‘distance’. This is an illustration of the impossibility of introducing the real nature of space. These authors are reduced to using an additional ‘abstract space’, in this case a vector of transport costs, and to assuming that this allows one to change from an abstract representation of a system situated at a single point to a system situated in a concrete space. The main criticism that can be levelled at this approach is as follows: why consider transport costs—and only them—to be a space-dependent variable? Why only transport when it is well known that there are enormous differences in land costs, labour costs, and transaction costs?

In sum, the spatial structure constructed by the functioning of the model is simply the projection of vector coordinates onto a Euclidian plane. It is just that a spatial aspect is attributed to transport costs alone by an arbitrary interpretation. The same operation could be done on the basis of labour costs, and a different projection would be obtained on the Euclidian plane. What would happen in a model which attributed a spatial aspect to each of its variables? Coordinates would be obtained in  $\mathbb{R}^n$  which could not be projected onto a two-dimensional Euclidian plane and consequently we could not be made to believe that it is actually a representation of real space. Such approaches are therefore based on a misunderstanding. By taking the reasoning to this extreme, we see that such approaches, by projecting the coordinates of a single variable onto a Euclidian plane, show us nothing. They start from one point, only to arrive at a set  $\mathbb{R}^2$  associated with a Euclidian plane, and the relation between this representation and concrete space is nonexistent and can be justified only by the researcher's arbitrary viewpoint. Therefore there is indeed a confusion between concrete space and space as an instrument of thinking.

### 3 Territory as a socioeconomic construct

Having criticized the way in which the present main schools of economic thought consider space, I need to demonstrate the benefits of a territory-based approach. Of course, this approach has disadvantages too. It is not intrinsically 'better' than the others. However, it is perfectly attuned to the problems of regions, towns, and localized economic activities. In this sense it makes an important contribution which I will seek to define more precisely at the end of this paper. However, the proponents of territorial space have scarcely clarified the conception of space underlying their approach and have often proved incapable of answering criticisms about this point. In section 3.1 we shall see that territory is constructed from the two types of space that have been distinguished hitherto: space as an instrument of thinking explaining socioeconomic interrelations, and concrete, physical space. In section 3.2 I provide some examples of territorial relations. Last, in section 3.3 I propose a formalization of the concept of territory, thanks to a special mathematical language—*Q*-analysis.

#### 3.1 Proximity and distance are metric realities *and* socioeconomic constructs

When we address the paradigm of territorial space, we use a different approach. Now each representation of the economic system, each model, each theory, has a number of categories as its starting point. In order to distinguish the territorial approach from the others, it is therefore necessary to clarify the way in which its fundamental categories are established. In fact, the categories are not given, they are actually psychosocial constructs based on conventions as much as on an objective reality. Thus, whereas countless theories are based on the category of 'firm', this concept is used to encompass realities as different as IBM and the street-corner bar or tobacconist's shop. As soon as one seeks to define more precisely what a firm is, the concept appears to be more elusive, revealing more the convention that binds economists than the reality of the firm. Further examples could be given, such as the distinction between current expenditure and investment expenditure, the money supply, a market, etc. The categories on the basis of which we work are therefore always debatable but are nevertheless essential to an understanding of reality. The question that concerns us at present is: is space an objective reality independent of conventions among persons? Are the region, nation, country, and town categories like the others from which an objective theory can be constructed?

The answer is, of course, 'no', and to convince ourselves we need only think of the literature that was written on the concept of region or on that of nation in the 19th century, all of which are concepts based on more or less stable conventions. Space does, of course, have a 'metric' reality but it certainly cannot be reduced to that. It is, in addition, dependent on the attention, action, and intentions of people and researchers towards it. That is why it is now necessary to transcend the opposition between a space that is merely a reflection of our thinking and a totally objective space. *Territorial space may thus be defined as the linking of the physical proximity of various elements and of socioeconomic interrelations between these elements.* To territory as a spatioeconomic reality must be added actors who interact with each other and, above all, with the backcloth that is territorial space. The place where territorial space and the action of the economic actors located there meet constitutes what I will call a *milieu*.

### **3.2 Territory: a backcloth of preexisting interrelations**

A region contains many different elements: towns, villages, enterprises, individuals, groups, transport routes, and so on. A territory-based approach starts out from a number of relations which are such that a region—or a town, or any other spatial entity—may be considered relevant to economic analysis. Of these relations, let me mention the following, by way of example and without being exhaustive.

(1) At the level of infrastructure and town and country planning there are: de facto relations between the regional actors and transport infrastructure both with the outside world (accessibility) and inside the region; common constraints resulting from the attractiveness of the landscape and the condition of the building stock (land availability, presence of industrial wasteland, etc); the interdependence between the place of work and the place of residence, and more generally between the cost of living (price level: rent, subsistence, transport prices, etc) and wage levels; and so on.

(2) At the level of political and administrative organization there are: the de facto relationship between the persons, enterprises, and other bodies, on the one hand, and the political authorities who wield power over the region in which they are located, on the other; interdependence resulting from the use of a common currency involving a community of problems during currency fluctuations; interdependence among economic actors and between economic actors and regional authorities vis-à-vis taxation; integration in common institutional structures (labour-market agreements, organization of lobbies, award of public contracts, etc); and so on.

(3) At the sociocultural level there are: family relations; interpersonal relations resulting from community life (associations, sports clubs, use of the same training, leisure, health, and transport services, etc); interdependences created by the regional media or by the defence of common issues vis-à-vis bodies outside the region; and so on.

(4) At the level of information there are: reputation effects (not only for restaurants but also for recognition of know-how and other professional skills); imitation effects [Marshall (1956) mentioned the ease of dissemination of new technologies among enterprises in the same region]; and so on.

(5) At the labour-market level there are: the relationship between enterprises' innovative capabilities and the know-how available on the local labour market; the relationship between the available know-how and the region's training and research facilities; the relationship between the prosperity of enterprises and local authorities and ability to invest in research and training; interpersonal relationships built up in the course of professional careers (during studies or various posts held); and so on.

These multiple interdependences form a preexisting backcloth which a territory-based approach considers as the point of departure for the exercise. It should be noted in passing that the relations described above do not necessarily facilitate collaboration or harmony in a neighbourhood: two enterprises in the same region may be in conflict, an enterprise may be in conflict with the local or regional authorities. The nature of the relationship—be it one of cooperation, competition, or something else—is immaterial; what is important is that spatial proximity is the fundamental reason why this relationship exists.

Territory, as is clear from the above examples, always has at least two linked dimensions. First, there is physical proximity; second, physical proximity is joined by a proximity, relationship, or interdependence of a different kind: industrial, commercial, professional, family, political, etc. But that is a 'minimum' territoriality. More generally, in an industrial district, technopole, town, or milieu, territory is characterized by the interpenetration of numerous dimensions of reality. The political, economic, social, and cultural aspects are superimposed, and it is difficult to regard one's neighbour only as a competitor or colleague or friend or the postperson. These different dimensions act together and bring out the full depth of the local, regional, or urban system. *Territory works on multidimensionality and interdependence. It is not possible to conceive of a localized system without taking into account these multiple interdependences and the extraordinary possibility of playing in many different registers at the same time or alternately.*

Therefore there exists de facto a series of interdependences due to spatial proximity. Of course, the degree and the nature of interpenetration in a given region is itself an outcome of regionally specific forces. It is Durkheim's 'milieu' (1904), where the different aspects of reality become intermingled to form a milieu with systemic properties. This takes us back to an old debate in economics (Schumpeter, 1935): must a phenomenon that is economic in nature (for example, a region's labour market) be explained solely by economic variables (price, quantity, marginal productivity, information, etc) or must room be left for other variables (professional standards, regulations, power, organization of training, etc)? The identification of the above interdependences requires us—if we are to be consistent with our approach—to choose the first solution when considering problems involving proximity.

The changes which many industrial regions have had to face over the past twenty years are a fine example of how this multidimensionality works. Initially these regions were dominated by industrial structures. The main enterprises imposed their style of organization, their relations with subcontractors, and their personnel management. In addition, they shaped the training and research institutions in the region and perhaps housing, association activities, transport infrastructure, industrial relations, and—certainly—political life. What happened when these predominant relations collapsed? Often (but not always) small entrepreneurs emerged, the politician took over, creating new social services, attracting outside companies, and encouraging innovation and enterprise. The family or association networks were sometimes reactivated to help some people, and development plans were set up to rehabilitate the old industrial sites. These many changes can be interpreted as a swing in the region's predominant relations. This swing is possible because, when the predominant structures collapse, different types of relations take over and begin to play a determining role.

A methodological difficulty results from this multidimensionality of territory. Each region, each space, will, of course, exhibit specific features. The GREMI IV survey (Bramanti et al, 1996) has clearly shown that regions specializing in the same activities (for example, the shoe, textile, or watch industries) react in very different

ways when confronted with similar economic challenges. A territory has its own logic whose multiple dimensions may discourage the researcher. Regional trajectories are differentiated and specific in each case.

This backcloth is thus the starting point of current analyses in terms of industrial districts, technopoles, and, especially, of innovative milieux. These interdependences are foremost, and it is by setting them to work that the regional system will evolve, innovate, develop, and become competitive and attractive compared with other spaces or, on the contrary, will break up and be drained of its interrelations and activities.

Proximity and physical distance are, *inter alia*, physical and objective realities and exist independently of people. Proximity and distance are thus structures that establish relations or separations between different elements. Proximity, in principle, links; in contrast, distance—although it may sound trivial—separates. The economic actors are thus situated in a space that structures their existence *a priori*. This is what causes a person born in Bamako not to have, at the outset, the same constraints and opportunities for action or the same income as a person born in Tokyo. Space is therefore a prime, irreducible reality that irrevocably places each individual in a specific economic structure that is both constraining and liberating.

### 3.3 *A first static formalization of the concept of territory*

The territory-based approach has often suffered from a lack of formalization. Formalization is particularly difficult in this field for the reasons stated above:

- (a) territory is the linking of two types of ‘proximities’, the one physical and the other a socioeconomic interdependence (for example, industrial proximity along a production system, proximity on which purchase–sale flows can circulate);
- (b) territory is not generally composed of a single type of socioeconomic interdependence; this would be a ‘minimum’ territory; on the contrary, it is characterized by the superimposition and interpenetration of the numerous dimensions of social life (multiple economic, political, social, family, cultural interdependences, etc);
- (c) last, and by no means the least difficult problem, a territory conceived of in this manner is specific in each case. A means therefore has to be found which explains both the special characteristics of each territory and the general character of the concept.

That being the case, we require a special mathematical language which, at one and the same time, allows us to trace relations between elements, to represent different types of relations in a combinatory fashion, to link these relations and the physical proximity between the elements, and last, to explain the general nature of the territory concept without losing the special features of each case. I think that *Q*-analysis is the appropriate mathematical language (Atkin, 1974; Holtier, 1992; Johnson, 1991).

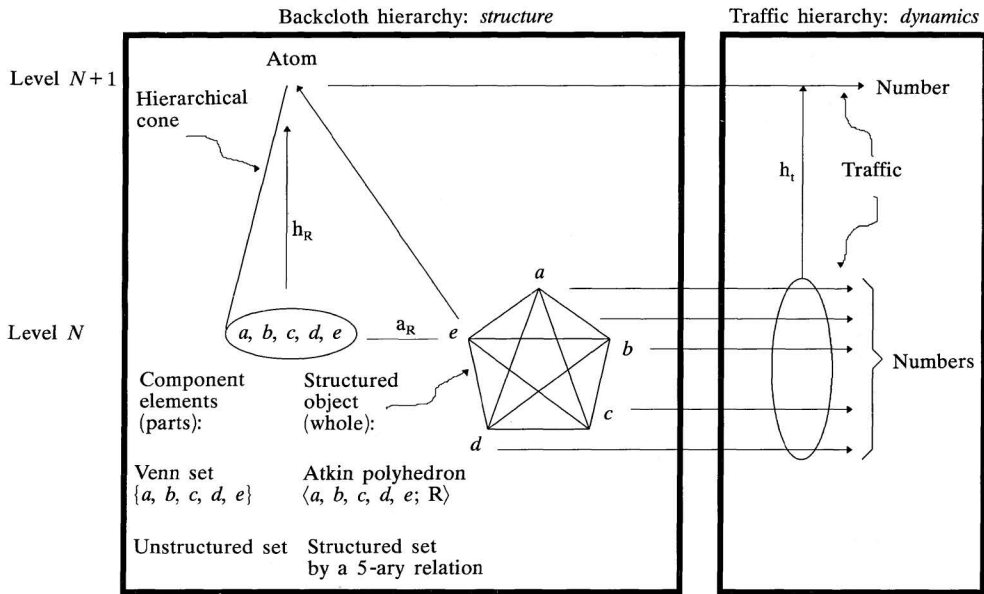
Here I am seeking mainly to explain the static and multidimensional structure of territory. A structure can be represented by entities interlinked by a set of relations (figure 1). The first problem is therefore to identify the entities and to group them together into a set. For example, the persons *a*, *b*, *c* and *d*, the institutions *A* and *B* and the enterprises *1*, *2*, and *3* are defined as the *parts* of a territory. All the parts of the territory are written  $\{a, b, c, d, A, B, 1, 2, 3\}$ . But a territory is also characterized by assembly relations, *R*, between these elements. For example, *a* works in enterprise *1*, *b* in enterprise *2*, *c* in enterprise *3*, and *d* in enterprise *2*. Person *a* has studied at institution *A*, as has *b*, whereas *c* and *d* studied at *B*. The process by which this assembly is performed can be written as

$$a: \{a, b, c, d, A, B, 1, 2, 3\} \rightarrow \langle a, b, c, d, A, B, 1, 2, 3; R \rangle .$$

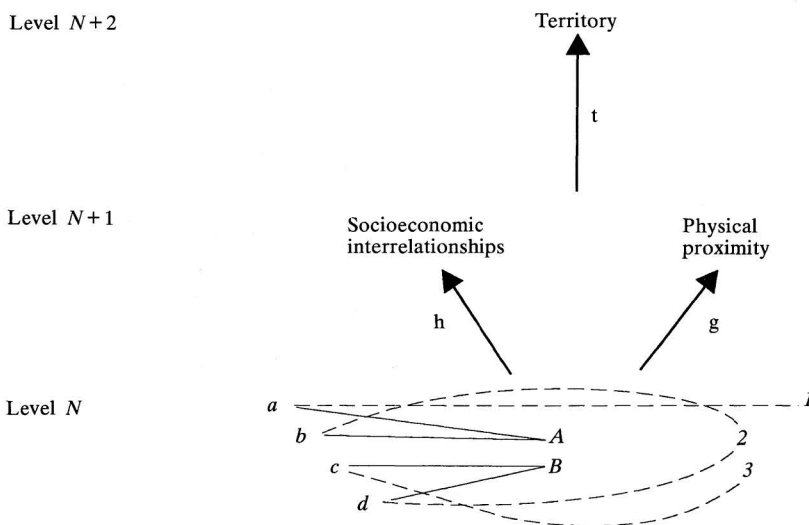
Now that we have defined the various elements that make up this object and the relations that they have with each other, it forms a new entity and it is possible to give it a name. Let us define as  $h$  the process by which the entity (level  $N$ ) is linked to its name at the upper level (level  $N + 1$ ). For example:

$$h: \langle a, b, c, d, A, B, 1, 2, 3; R \rangle \rightarrow \text{labour-market and study relations .}$$

In addition, we can define the relation  $h_R = h \circ a$  which links all the elements to the name. Please refer to the graphic representation (figure 2). These relations enable us to define a *universal construction* between the whole and the parts.



**Figure 1.** The fundamental diagram of  $Q$ -analysis: sets, structures, hierarchies, and flows (source: Johnson, 1991).



**Figure 2.** A first formalization of the concept of territory.

We can introduce an assembly relation  $b$  which is defined as ‘is physically close to’. Let us assume, for the sake of the example, that all the elements considered are physically close (it would be easy to include distant elements in the initial set only to find later that they are not concerned in the assembly relation). We will thus have:

$$b: \{a, b, c, d, A, B, I, 2, 3\} \rightarrow \langle a, b, c, d, A, B, I, 2, 3; R \rangle .$$

To this set of elements and relations we can give a name at a level  $N+1$ , in this case:

$$g: \langle a, b, c, d, A, B, I, 2, 3; R \rangle \rightarrow \text{physical proximity} .$$

Now we can introduce a second hierarchical level comprising the entities labour-market and study relations and physical proximity. At this level these two entities can be considered as elements of a set  $\{\text{labour market and study relations, physical proximity}\}$ . We can then apply the assembly relation  $R$

$$\begin{aligned} & \{ \text{labour market and study relations, physical proximity} \} \\ & \rightarrow \langle \text{labour market and study relations, physical proximity; 'is superimposed on'} \rangle , \end{aligned}$$

that is, a relation establishing the linkage between the relations based on physical proximity and those concerning the labour-market and study relations. We can give a name to this assembly at the level  $N+2$ , in this case a territory.

In summary, and in the general case, a territory may be defined by the following relation  $t$  (figure 2):

$$\begin{aligned} t: & \{ \text{socioeconomic interrelations, physical proximity} \} \\ & \rightarrow \langle \text{socioeconomic interrelations, physical proximity; 'is superimposed on'} \rangle \\ & \rightarrow \text{territory} . \end{aligned}$$

It should be pointed out again that these hierarchical relations between whole and parts are not *exclusive* but *inclusive*. For example, the enterprises (level  $N$ ) that participate in the ‘territory’ at the upper level ( $N+1$ ) can perfectly well participate in another line ( $M$ ) such as the ‘industrial sector’ (level  $M+1$ ). The language of  $Q$ -analysis thus allows great flexibility, capable of explaining the structure of a territory in its multiple dimensions. This is, of course, a first attempt which has to be developed. Moreover, this is only a static approach. Nevertheless, I think I have shown that an appropriate mathematical language allows the concept of territory to be formalized as clearly as the better established concepts in economics.

In the next section I seek to link the opposition between individuals and the economic system and the proximity–distance duality.

#### **4 Territoriality, rationality of actors, and economic development**

In section 3 I sought to define clearly the concept of territory. But it has yet to be shown in what way the territory-based approach can be useful in economics. That is the subject of this section. In section 4.1 I describe the type of interaction existing between the economic actors and a territory. In section 4.2 I define the milieu as the place where the territory and the actors located there meet. In section 4.3 I describe the way in which taking territory into account enhances our understanding of innovation processes.

##### **4.1 Interaction between territory and actors**

Space is partly an objective structure, but it is also the result of subjective and inter-subjective (social) action by individuals and other economic actors (Di Méo, 1991).

A description must therefore be given of the way in which proximity, the individual player, and the community of actors are linked.

Among other properties, space is a prime, immediate, inescapable, and *sensitive* datum. More particularly, our faculties operate in nearby space. Only artefacts—telephone, television, etc—enable our senses to apprehend a more distant reality. These artefacts considerably alter the proximity–distance opposition *but never destroy the structure it imposes on the economic system*. In such an approach, proximity may not be reduced to an ‘economy’, to some form of advantage; nor is it the subject of a choice, a decision, or a preference by the actors. Proximity is a backcloth of interrelations that structures the economy and actors’ behaviour. In that respect it is fundamental for an understanding of the development of a given economic system.

Territorial space therefore appears to be an opposition between what is near and what is far. This space thus forms an environment in which we must now conceptualize the presence, behaviour, and action of economic actors. Now this presence, this behaviour, and these actions in and on this territorial environment may not be apprehended simply as a positioning: the actors interact with their territory, transform it by their presence, their perception, understanding, and action. This perception, understanding, and behaviour are in turn transformed by the backcloth of interrelated elements which this territory constitutes. So this interaction works at several levels, which have in fact been very well described by geographers (Di Méo, 1991). It emphasizes space both as an objective reality when considering, for example, administrative boundaries or transport networks, and as a perceived subjective entity, working and living spaces, spaces that are utilized, spaces that are experienced.

#### **4.2 The milieu as a set of actors situated in a territory**

The interaction between the actors and the territory poses the problem of the actors’ rationality. Is this rationality defined once and for all, irrespective of the place where it is implemented? Or, on the contrary, must it be considered as dependent on its context? The economic player is always situated, and this gives rise to the need to control the nearby environment. As Lecoq (1993) shows, the concept of procedural rationality (Simon, 1976) fully enables one to conceive of economic actors’ behaviour in a territory: it is the backcloth to existing relations that is the point of departure of its behaviour. Thus consumers’ ‘needs’ are not independent of what is available in the nearby shops. Similarly, the behaviour of persons with regard to the acquisition of know-how and skills is not independent of the context in which they study or work. Last, it is because an entrepreneur knows the manager of a nearby enterprise that that entrepreneur will have the idea for a new product combining his or her skills with those of his or her neighbour (Maillat et al, 1993a). Interactions between territory and actors can thus be fully understood, thanks to procedural rationality. We can thus ask the following question: does the interaction between actors and their environment correspond to a particular type of procedural rationality? In other words, is there a difference between a rationality applied to a territory and a rationality applied to more distant objects? Without answering this question, we can notice with Pecqueur and Soulage (1992) that territory allows a learning process which is collective, free, direct, and interactive. This would mean that learning occurring at distance would be more individual or bilateral, that it needs a deliberate will, that it requires means (telecommunication or transportation), and that it is less interactive. Physical proximity seems, then, to intervene specifically through the proximity interdependences described above.

*By starting from procedural rationality and the close dependence that proximity implies between the nearby environment and the economic players, one transcends the opposition between objective space and the various socioeconomic 'spaces'. Indeed, in this conception space is no longer given and predefined, it is no longer an ordinary, inert, medium; nor is it any longer a simple mental representation of the world that is independent of any spatial anchorage; it is a codependent space, both a product and a factor of production, coproduced by people's (imperfect) perception of, and influence on, their geographic, economic, and cultural environments, which are partly—but only partly—external to them.*

The role of physical proximity in the functioning of the economic system may thus be clearly described and understood. In my view it is the fulcrum on which many of today's works on endogenous development and innovative milieux rest. Indeed, unless a very special role is played by physical proximity in learning processes and in the behaviour of players, how can one defend the idea that an industrial district is necessarily a localized system? Why could not an industrial district be a system made up of industrial proximities but without physical date? If, first, the proximity interdependences described above are introduced and then the multiplicity and interpenetration of these interdependences are highlighted within the context of a territory, the answer to this question appears to be clearer.

Proximity and distance are not only constructed by the economic actors. They also have an objective reality which is independent of those actors, which resists and always will resist. There will always be proximity interdependences that have not been deliberately constructed by the actors and that provide them with a constraining and liberating framework; it will always be necessary to consume time and money to overcome distance, irrespective of the transport and information-flow technologies that are developed. *Space is thus a prime reality which is largely imposed on the actors, and this basically trivial truth irremediably condemns all theoretical approaches based on  $\mathbb{R}^2$  and correctly reflects the interactions between space and economy.*

#### **4.3 Proximity, distance, and economic development**

It is now appropriate to return to the role of proximity and distance—with the meaning given above—in economic development. In this section I suggest, by using the example of innovation, that a territorial approach sheds new light on most economic processes.

The nodal point which in my opinion allows us to understand the role of the proximity–distance duality in economic development lies in the differentiated conditions of innovation. The regional dynamics of the innovative milieu type, based on the use of proximity, are radically different from dynamics based on distance and the use of distance mainly, but not solely, by the large multinational companies. Large companies rely largely on localized specific input, as many studies tend to show. Nevertheless, contrary to most small firms, a large multinational also controls distance and can utilize to its advantage the spatial and international division of labour and, in this sense it is not a prisoner of the know-how, wage levels, and other proximity interdependences in a region. The objective of innovation, for a large company, is above all to preserve the profitability of its investments. Thus a large company will easily be able to develop a product in Europe, manufacture it in Malaysia, and sell it in the United States; the criterion for innovation will be profitability at the level of the organization as a whole.

If we now adopt the perspective of an entrepreneur based in a region where there is no—or little—opportunity to organize production on an international scale, innovation has a much more global objective: the aim is not only to ensure a certain

profitability for the company but to ensure its survival in a given regional context from the viewpoint of know-how, remuneration levels, and the other proximity interdependences.

A large company can launch a product which it will manufacture partly in one country at high labour costs and partly in a low-wage country. A regional small or medium-sized enterprise or enterprise creator will not select such a product. They will be compelled to devise others, one of the main characteristics of which is to leave an added value corresponding to the conditions prevailing in the region. The structuring of their nearby space therefore closely conditions their behaviour, and vice versa. The regional actors play a different game. Consequently, the stakes are different, and this does not fail to have an influence on the innovation process, on the type of products that are made, and on the resultant processing operations in the production system.

When speaking of the spatial and functional division of labour, Aydalot (1976) said that the big companies tended to locate their operations where labour reproduction costs were lowest. Talking about labour reproduction costs rather than wages allows one to include in the theory training costs and lifestyle-related costs (consumption of urban services such as restaurants, shows, creches, etc) that are typical of proximity interdependences. Let us expand this idea, not only to explain the location of the big companies but also to specify the local constraints under which endogenous development processes take place. Seen from such an angle, endogenous development becomes the sum of the processes which enable a region to ensure its consistent reproduction and in particular the reproduction of its inhabitants, who are also its workers, entrepreneurs, and citizens. Consistent reproduction means that the many dimensions of territory develop together: there is a certain coherence between the level of wages and that of living costs, between workplaces, housing, and the transport system, between know-how and companies' areas of operations.

### **5 Conclusions: denied space or confiscation of the economic approach**

It emerges from all this that the taking into account of proximity by the economic researcher constitutes a special challenge. Seeking to understand a territory and its evolution means taking the trouble to identify systems that are specific in each case. So there are no ready-made solutions. On the other hand, the researcher is attuned to reality. He or she then becomes able to furnish the regional actors with an image of what they are, of their history, and of what they can do. In the best case the researcher becomes a development player. In that respect I believe one can truly talk about 'political' economy. That is also why it is very important to state the researcher's intentions because it is only in the light of these intentions that his or her approach can be described as consistent or 'scientific'.

By writing this paper I wanted to show that economists who use a territory-based approach proceed at least as consistently as others, given that it corresponds to certain intentions. In brief, those intentions are the will to understand, to explain, and win recognition for the existence, autonomy, and importance of economic dynamics at the regional or local level. Politically, this work goes against the centralization and concentration of power both in institutions and in companies. They seek to gain recognition for the irreducible specificity and special features of regional economic dynamics. In this sense, the territory-based approach seeks to explain and justify the maintenance and development of the diversity of situations and is thus opposed to a linear and homogenizing vision of economic development.

These intentions are obviously not neutral and that is why it is important to explain them. Does that mean the approach is any less scientific? Certainly not, because whatever the approach selected it implies certain relations between the subject of the research, and the way it is perceived and described by the researcher. It is always possible to identify the—sometimes unwitting!—intentions of the researcher.

In this sense we have to return to the conventional approaches and state that their intentions regarding specific regions are not neutral either. These approaches also have their merits and of course manage to give a certain vision of the way the economy works. Here I would like to confine myself to showing their inadequacies in relation to real territories and the economic policy relating thereto. All too often, nonterritorial approaches discard space and are consequently incapable of explaining the economic actors' ability to develop, shape, and utilize their space, proximities, and distances and to interact with their territory to create a genuine living and working space. Failure to take into account territory is thus tantamount to denying all possibilities for the economic actors to influence their territory or to shape it as a function of their plans and capabilities. The system and the economic agents act in a preconceived and predefined space, which is tantamount to confiscating from them, in terms of theory, policies, and the resultant spatial practices, the ability to influence the development of their space, region, or town—in a word, their milieu.

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